Introduction to Machine Vibration Testing

Introduction to Machine Vibration Testing is for anyone learning how to apply vibration testing as part of a proactive maintenance program aimed at reducing unplanned downtime of rotating machines. The course takes a pragmatic approach to educating students with varying levels of technical knowledge about machine vibration, condition monitoring, and operation of vibration testing tools. The class provides an introduction to vibration fundamentals and testing techniques used to detect the 4 most common vibration faults: imbalance, misalignment, looseness, and bearing faults. Students are encouraged to bring whatever testing tools they intend to use to class. Most of the training materials are generic and applicable to a wide range of vibration meters and analyzers, however for students with Fluke vibration testing tools or with no vibration testing tools, Fox River Systems provides training materials specific to operation of the Fluke 810 Vibration Tester, Fluke 805FC Vibration Meter, and Fox River Systems’ Explorer 805 Software used in class.

Fox River Systems approach to training maximizes the student learning experience by striking a balance between lecture and hands-on laboratories and between essential theory of operation and practical applications.

The key takeaways from the class include:

- Understanding basic machinery vibration concepts and the top 4 most common rotating equipment faults: imbalance, misalignment, looseness, and bearing faults
- Essential vibration program tasks such as machine drive train documentation, vibration measurements for screening analysis/diagnosis, reporting, and trending/tracking machine performance.
- Instrument operations including making and saving measurements, uploading measurements to a PC, and software introduction
- Proper measurement techniques
- Accessibility to measurement locations
- Measurement Safety

Student Materials included:

- Introduction to Machine Vibration presentation materials
Training Syllabus

- Introductory Material
  - Vibration Screening and Testing as part of a proactive maintenance program
  - Other machine health testing techniques that complement vibration testing
  - Vibration fundamentals
    - Simple Harmonic Motion
    - Time Waveforms
    - Amplitude (Peak, Peak-to-Peak, RMS)
    - Frequency and Fast Fourier Transform (FFT) Spectrums
    - Measurement units: Acceleration, Velocity, and Displacement
  - Machine drive speed determination
    - Frequency and Order Tracking
    - Shaft speed measuring tools: laser tachometers, stroboscopes, and encoders
    - Shaft speed measurement with a tachometer
  - Machine faults and method for detecting the fault:
    - Imbalance
    - Misalignment
    - Looseness
    - Bearing faults

- Vibration Meter/Tester—Instrument Overview
  - Instrument physical connections of sensors/transducers and tachometer signals
  - Menu navigation and instrument operation
  - Instrument configuration/settings for making measurements
  - Making and saving measurements
  - Measurement analysis and diagnosis

- For Fluke users: Fluke 805FC Vibration Meter & Fluke 810 Vibration Tester Operations
  - Software installation and configuration assistance for Fluke Viewer software and Fox River Systems’ Explorer 805 Software
  - Developing machine setups/machine train definition
  - Saving & recalling machine setups
  - Shaft speed determination using the tachometer
  - Collecting vibration data
  - Reviewing measurements by severity/understanding the cause
  - Downloading vibration measurement information to a PC
  - Report generation with Fluke Viewer and Explorer 805

Ordering Information for this class and related classes:

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<td>Introduction to Machine Vibration (for all vibration testing tools including Fluke 805FC &amp; Fluke 810)</td>
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<td>MORT-VIB-FLUKE</td>
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<td>STARTUP-VIB-FLUKE</td>
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